Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the

application:

Listing of the Claims

1. (currently amended) ~~A video~~ In a video encoder, a video encoding method for
selecting the mode of a current macroblock of an inter-coded frame, the method comprising at
least one of:

checking first modes for a subset of macroblock modes, selectively checking other modes
in response to motion vector information of the checked first modes, and selecting the mode for
the current macroblock in response to the checked modes;

checking the macroblock mode of at least one neighboring macroblock, and selecting the
mode for the current macroblock in response to the macroblock mode of the at least one checked
neighboring macroblock;

checking the cost of a subset of macroblock modes, further checking only intra-coded
modes if the checked cost meets a preset criteria, and selecting the mode for the current
macroblock in response to the checked modes; and

adjusting an early-stopping threshold in response to checked macroblock modes, and
selecting the mode for the current macroblock in response to the checked macroblock modes if
the adjusted early-stopping threshold is met.

2. (original) A video encoding method as defined in Claim 1, the method comprising
checking first modes for a subset of macroblock modes, selectively checking other modes in
response to motion vector information of the checked first modes, and selecting the mode for the
current macroblock in response to the checked modes.

3. (original) A video encoding method as defined in Claim 1 wherein said first modes
comprise the quadratic modes of SKIP, 16x16, 8x8, and 4x4.

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4. (original) A video encoding method as defined in Claim 1, further comprising checking the macroblock mode of at least one neighboring macroblock, and selecting the mode for the current macroblock in response to the macroblock mode of the at least one checked neighboring macroblock.

5. (original) A video encoding method as defined in Claim 1, further comprising checking the cost of a subset of macroblock modes, further checking only intra-coded modes if the checked cost meets a preset criteria, and selecting the mode for the current macroblock in response to the checked modes.

6. (original) A video encoding method as defined in Claim 1, further comprising adjusting an early-stopping threshold in response to checked macroblock modes, and selecting the mode for the current macroblock in response to the checked macroblock modes if the adjusted early-stopping threshold is met.

7. (original) A video encoding method as defined in Claim 1, further comprising:
    initially performing motion estimation only for a subset of the possible block sizes; and
    using the motion information to determine if other motion estimation or complexity measures should be performed for other block sizes.

8. (original) A video encoding method as defined in Claim 7 wherein said first modes are checked first and their motion information is used to decide if other modes needs to be checked.

9. (original) A video encoding method as defined in Claim 1 wherein spatial/temporal neighboring macroblock and block partition information is used to decide the subset of possible block sizes or inter/intra modes that need to be checked.

10. (original) A video encoding method as defined in Claim 1, further comprising:

initially performing mode checking for a subset of both inter modes and intra modes;

calculating a complexity measure responsive to the mode checking; and

using the complexity measure to determine if other inter modes and intra modes should

be performed.

11. (original) A video encoding method as defined in Claim 6 wherein the early stop criteria are based on adaptive thresholding to stop checking other inter or intra modes.

12. (original) A video encoding method as defined in Claim 1 wherein early termination takes place if spatially or/and temporally neighboring macroblocks have a specific relationship with the motion information of the current macroblock after examining a specific mode.

13. (original) A video encoder for encoding video signal data and selecting the mode of a current macroblock of an inter-coded frame, the encoder comprising at least one of:

first means for checking the first modes for a subset of macroblock modes, selectively checking other modes in response to motion vector information of the checked first modes, and selecting the mode for the current macroblock in response to the checked modes;

macroblock means for checking the macroblock mode of at least one neighboring macroblock, and selecting the mode for the current macroblock in response to the macroblock mode of the at least one checked neighboring macroblock;

subset means for checking the cost of a subset of macroblock modes, further checking only intra-coded modes if the checked cost meets a preset criteria, and selecting the mode for the current macroblock in response to the checked modes; and

stopping means for adjusting an early-stopping threshold in response to checked macroblock modes, and selecting the mode for the current macroblock in response to the checked macroblock modes if the adjusted early-stopping threshold is met.

14. (original) A video encoder as defined in Claim 13, the encoder comprising first-checking means for checking first modes for a subset of macroblock modes, selectively checking

other modes in response to motion vector information of the checked first modes, and selecting the mode for the current macroblock in response to the checked modes.

15. (original) A video encoder as defined in Claim 13 wherein said first modes comprise the quadratic modes of SKIP, 16x16, 8x8, and 4x4.

16. (original) A video encoder as defined in Claim 13, further comprising neighbor-checking means for checking the macroblock mode of at least one neighboring macroblock, and selecting the mode for the current macroblock in response to the macroblock mode of the at least one checked neighboring macroblock.

17. (original) A video encoder as defined in Claim 13, further comprising intra-checking means for checking the cost of a subset of macroblock modes, further checking only intra-coded modes if the checked cost meets a preset criteria, and selecting the mode for the current macroblock in response to the checked modes.

18. (original) A video encoder as defined in Claim 13, further comprising thresholding means for adjusting an early-stopping threshold in response to checked macroblock modes, and selecting the mode for the current macroblock in response to the checked macroblock modes if the adjusted early-stopping threshold is met.

19. (original) A video encoder as defined in Claim 13, further comprising:
motion-estimation means for initially performing motion estimation only for a subset of the possible block sizes; and
determination means for using the motion information to determine if other motion estimation or complexity measures should be performed for other block sizes.

20. (original) A video encoder as defined in Claim 19 wherein said first modes are checked first and their motion information is used to decide if other modes needs to be checked.

21. (original) A video encoder as defined in Claim 13 wherein spatial/temporal neighboring macroblock and block partition information is used to decide the subset of possible block sizes or inter/intra modes that need to be checked.

22. (original) A video encoder as defined in Claim 13, further comprising:

inter/intra checking means for initially performing mode checking for a subset of both inter modes and intra modes;

complexity means for calculating a complexity measure responsive to the mode checking; and

inter/intra determination means for using the complexity measure to determine if other inter modes and intra modes should be performed.

23. (original) A video encoder as defined in Claim 18 wherein the early stop criteria are based on adaptive thresholding to stop checking other inter or intra modes.

24. (original) A video encoder as defined in Claim 13 wherein early termination takes place if spatially or/and temporally neighboring macroblocks have a specific relationship with the motion information of the current macroblock after examining a specific mode.

25. (currently amended) A computer readable non-transitory medium ~~digital videodisc~~ encoded with signal data comprising a plurality of block transform coefficients, the signal data resulting from at least one of:

checking first modes for a subset of macroblock modes, selectively checking other modes in response to motion vector information of the checked first modes, and selecting the mode for the current macroblock in response to the checked modes;

checking the macroblock mode of at least one neighboring macroblock, and selecting the mode for the current macroblock in response to the macroblock mode of the at least one checked neighboring macroblock;

checking the cost of a subset of macroblock modes, further checking only intra-coded modes if the checked cost meets a preset criteria, and selecting the mode for the current macroblock in response to the checked modes; and

adjusting an early-stopping threshold in response to checked macroblock modes, and selecting the mode for the current macroblock in response to the checked macroblock modes if the adjusted early-stopping threshold is met.

26. (currently amended) A computer readable non-transitory medium ~~digital video disc~~ as defined in Claim 25, the signal data resulting from checking first modes for a subset of macroblock modes, selectively checking other modes in response to motion vector information of the checked first modes, and selecting the mode for the current macroblock in response to the checked modes.

27. (currently amended) A computer readable non-transitory medium ~~digital video disc~~ as defined in Claim 25 wherein said first modes comprise the quadratic modes of SKIP, 16x16, 8x8, and 4x4.

28. (currently amended) A computer readable non-transitory medium ~~digital video disc~~ as defined in Claim 25, the signal data further resulting from checking the macroblock mode of at least one neighboring macroblock, and selecting the mode for the current macroblock in response to the macroblock mode of the at least one checked neighboring macroblock.

29. (currently amended) A computer readable non-transitory medium ~~digital video disc~~ as defined in Claim 25, the signal data further resulting from checking the cost of a subset of macroblock modes, further checking only intra-coded modes if the checked cost meets a preset criteria, and selecting the mode for the current macroblock in response to the checked modes.

30. (currently amended) A computer readable non-transitory medium ~~digital video disc~~ as defined in Claim 25, the signal data further resulting from adjusting an early-stopping threshold in response to checked macroblock modes, and selecting the mode for the current

macroblock in response to the checked macroblock modes if the adjusted early-stopping

threshold is met.

31. (currently amended) A computer readable non-transitory medium digital video disc

as defined in Claim 25, the signal data further resulting from:

   initially performing motion estimation only for a subset of the possible block sizes; and

   using the motion information to determine if other motion estimation or complexity

measures should be performed for other block sizes.

32. (currently amended) A computer readable non-transitory medium digital video disc

as defined in Claim 31 wherein said first modes are checked first and their motion information is

used to decide if other modes needs to be checked.

33. (currently amended) A computer readable non-transitory medium digital video disc

as defined in Claim 25 wherein spatial/temporal neighboring macroblock and block partition

information is used to decide the subset of possible block sizes or inter/intra modes that need to

be checked.

34. (currently amended) A computer readable non-transitory medium digital video disc

as defined in Claim 25, the signal data further resulting from:

   initially performing mode checking for a subset of both inter modes and intra modes;

   calculating a complexity measure responsive to the mode checking; and

   using the complexity measure to determine if other inter modes and intra modes should

be performed.

35. (currently amended) A computer readable non-transitory medium digital video disc

as defined in Claim 30 wherein the early stop criteria are based on adaptive thresholding to stop

checking other inter or intra modes.

36. (currently amended) A <u>computer readable non-transitory medium</u> <s>digital video disc</s> as defined in Claim 25 wherein early termination takes place if spatially or/and temporally neighboring macroblocks have a specific relationship with the motion information of the current macroblock after examining a specific mode.

37. (currently amended) <s>A video</s> <u>In a video encoder, a video</u> encoding method for selecting the encoding mode of a macroblock of an inter-coded frame, the method comprising:

selecting a subset of macroblock modes for encoding;

comparing said subset of macroblock modes for coding efficiency; and

selecting a mode having favorable coding efficiency, responsive to said step of comparing modes.